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has been practically reëngined, and, in order that additional warmth may be secured, has been lined with three thicknesses of felt. She is taking out a very large supply of provisions, a number of sledges, and two additional members to the Franz Josef Land party. The Windward does not go out on this occasion for the purpose of bringing Mr. Jackson home. She will call at Vardö, when, after embarking sheep, coal and live reindeer, she will sail direct for Franz Josef Land. Four or five days after leaving Vardö she will get into the ice belt, which will probably be of 300 miles width. It is hoped she will get through this in about a fortnight, and it is anticipated that she will communicate with the explorers at Cape Flora, Franz Josef Land, on or about July 20th. As soon as the Windward has discharged her cargo she will leave Franz Josef Land with news of the doings of the explorers, and as she is bound, owing to the ice conditions, to sail before August 20th, she may be expected in England by the end of September. About this time next year, if all has gone well, she will leave London again to bring the explorers home.

PROF. WM. H. BREWER contributes to the Yale Scientific Monthly an account of the observations he has made during the past 45 years on earth tremors at Niagara Falls. The heaviest vibrations were on either side and near the Horseshoe Fall. They disappeared in places in the soft shales below the limestone, although they were evident in the harder beds of limestone and sandstones interstratified with the shales. Passing down the river along the brink of the gorge, the vibrations rapidly decreased in intensity, becoming too faint to be perceived between the two suspension bridges, increasing again on nearing the rapids. It is a popular belief of persons living near the Falls that crystals are more common in the rocks there than elsewhere in the same formation. But macroscopic examination of limestones taken near the Falls and those gathered a few miles away did not show that the crystallization or the texture of the rocks had been affected by the jar of the cataract. As Prof. Brewer remarks, it would be interesting to make the investigation microscopically, and to study the jar of the cataract with proper instruments.

UNIVERSITY AND EDUCATIONAL NEWS.

THE *Oxford University Gazette* for June 9th contains the eighth annual report of the delegates of the University museum (1895). It will be remembered that two important changes were made during that year, Mr. Francis Gotch having succeeded Dr. J. S. Burdon-Sanderson as professor of physiology, and Mr. Henry A. Miers having succeeded Prof. H. M. Storey Maskelyne as professor of mineralogy. The principal improvement in the museum building during the year was the alteration and fitting up of two rooms in the department of medicine for a pathological laboratory, the cost of the scientific installation of which has been defrayed out of a sum of £500 presented by a benefactor who does not wish his name to be made public. Prof. Sanderson, the Regius professor of medicine, on his resignation of the physiological chair presented to the laboratory instruments to the value of £105, made under his direction during his tenure of the chair, and paid for by him in excess of the departmental income. The fine portrait of Prof. Burdon-Sanderson, painted in 1893 by the Hon. John Collier, has been presented to the department by Mrs. Burdon-Sanderson.

THE June examination under charge of the University of the State of New York was the largest in the history of the department. About 400,000 question papers were required, all of which were printed in the department by its own employees. The preliminary examinations for professional and technical students, and those for license to practice were so large that the accommodations heretofore in use proved insufficient. Besides the 69th regiment armory in New York City it became necessary to use two large assembly rooms in the New York University building in Washington Square.

IN response to an appeal by the Chancellor at the annual banquet of the alumni of Vanderbilt University, twenty-six of those present made subscriptions of one hundred dollars each to endow a chair in the University. An endeavor will be made to increase the amount to \$50,000 within the next year. The annual address before the University body was delivered by Postmaster-General William L. Wilson.

WILLIAM T. MAGRUDER, M. E., adjunct professor of mechanical engineering in Vanderbilt University has resigned and has been elected professor of mechanical engineering in the Ohio State University.

SCIENTIFIC LITERATURE.

The Jack Rabbits of the United States. By T. S. PALMER, M. D., Assistant Chief of Division. Bulletin No. 8, U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Washington. Government Printing Office. 1896. 8vo., pp. 84, 6 pll. and frontispiece and 2 text figures.

No jack rabbits are found in the United States east of about the 95th meridian; west of this line they are of almost universal distribution, sometimes several species occurring over the same area. They extend northward over the plains of the Saskatchewan, and southward into Mexico far beyond our southern border. The extent of their abundance and the amount of injury they are capable of doing to growing crops is little known to the general public, outside of the jack rabbit area. In Bulletin No. 8, of the Division of Ornithology and Mammalogy of the U. S. Department of Agriculture, a vast amount of information is given on both these points, both statistically and pictorially, Dr. Palmer having treated his subject with great thoroughness, and in a way at once interesting to the naturalist and the general reader. The matter is non-technical and relates to the habits and distribution of the five or six species (no attempt is made to discriminate the subspecies) found in the United States, including their abundance and rapidity of increase; their injury to crops and the means of protection against them, and the methods of destruction employed to reduce their numbers. There is also a chapter on 'Rabbit Drives and Hunts,' and another on the value of jack rabbits as game.

In respect to the abundance of these animals over certain areas, Dr. Palmer gives some striking statistics. For instance, he states that in Modoc county, California, 'nearly 25,000 jack rabbits were said to have been killed in three months on a tract of land only six by eight miles in extent.' "A still more remarkable case has been recorded in the San Joaquin Val-

ley. Some of the early drives near Bakersfield took place on a ranch less than one square mile in extent. In the first drive, on the afternoon of January 2, 1888, 1,126 rabbits were killed; as soon as the animals were dispatched, the same field was passed over again and 796 more killed. A week later, on January 10th, there were two drives on the same ground, the first resulting in the destruction of 2,000 rabbits, the second in more than 3,000; in the latter an adjoining field was also driven over. It was estimated that altogether about 8,000 rabbits were killed on this ranch in nine days. The 'Kern County Echo' of March (8?) 1888, stated that a total of about 40,000 rabbits had been killed in the drives about Bakersfield from January 1, 1888, up to that date, and referred to an estimate that two-thirds of the rabbits killed in the drives were females and the average number of young of each of these was $3\frac{1}{2}$. On this basis it was computed that had these 40,000 rabbits lived two months they would have increased to 135,000. When it is considered how much injury a single rabbit can do, the damage which such an army of rabbits is capable of inflicting would hardly be less than that caused by a grasshopper plague." In another place Dr. Palmer states that "it has been estimated" that five jack rabbits consume as much as one sheep."

As means of protection rabbit-proof wire fences are sometimes resorted to, and poisons are occasionally used to reduce the number of rabbits; many are also shot, but the chief dependence is wholesale destruction by drives. These are described at length, and illustrated by cuts and some striking reproductions of photographs of some of the remarkably effective drives made about Fresno, in California, where in one instance 20,000 rabbits were killed in a single drive. In the larger drives hundreds of men and boys participate, some on foot but many on horses. It is said that in one drive near Fresno, resulting in the death of 15,000 rabbits, 2,000 horsemen took part. A list of 155 rabbit drives in California is given, with a map showing their location. These drives resulted in the destruction of nearly 400,000 rabbits during a period of about eight years. Lists of drives made in Oregon, Utah, Idaho and Colorado are also given.